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## PATENT SPECIFICATION

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### COMPLETE SPECIFICATION

#### Improvements in or relating to Mixing Machines

We, JAMES CRUICKSHANK LIMITED, of 20, Duff Street, Edinburgh, Scotland, a British Company, and FREDERICK WILLIAM GALLIMORE, of 33, Thorburn Road, Colinton, Edinburgh, Scotland, a British Subject, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to an improvement in or modification of the invention described and claimed in our pending Patent Application No. 22494/48 (Serial No. 649,477) wherein a mixing or agitating machine of the kind having a stationary mixing bowl or container detachably supported in a yoke, saddle or carrier vertically adjustable in a guideway on the machine frame and capable of being raised to lift the bowl to the mixing position and of being lowered for removal of the bowl from the machine has the bowl carrier provided with hydraulic lifting mechanism mounted on a fixed part of the machine.

According to the present invention, there is provided a bowl clamp for detachably securing the bowl to the bowl carrier of the machine, and the said bowl clamp is acted upon by the hydraulic lifting mechanism to clamp the bowl to the bowl carrier before the said lifting mechanism acts upon the bowl carrier to lift the bowl to the mixing position.

Conveniently, the bowl clamp comprises a substantially semi-circular or bifurcated clamping member mounted above the bowl carrier and having its arms pivotally attached thereto at a distance from the ends of the arms of said clamping member, the ends of which are adapted to bear upon lateral lugs, projections or flanges on the bowl in order to clamp the bowl in position on the bowl carrier when the clamping member is

rocked about its pivotal axis by the engagement of the hydraulic lifting mechanism with the underside of the clamping member at a point midway between the ends thereof.

A preferred form of the present invention will now be particularly described with reference to the accompanying drawings in which:—

Figure 1 is a side elevation of the machine with the bowl shown in full lines in a lowered position and clamped to the bowl carrier. The dot and dash lines indicate the fully raised position of the body and rim of the bowl.

Fig. 2 is a sectional plan view on the line 2—2 in Fig. 1.

Fig. 3 is an enlarged cross-sectional view on the line 3—3 in Fig. 2 showing the bowl clamp closed.

Fig. 4 is a similar view to Fig. 3 showing the bowl clamp open.

In the construction illustrated, the machine disclosed in our pending patent Application No. 22494/48 (Serial No. 649,477) is modified by the provision of a bowl clamp 11 above and pivotally attached to the bowl carrier 10 of the machine, the bowl clamp comprising a substantially semi-circular or bifurcated member having hinge lugs 12 attached by hinge pins 13 to upstanding lugs 14 on the bowl carrier 10. An upstanding pin or projection 15 is provided on each arm of the bowl carrier 10. The bowl 16 is located in position on the bowl carrier 10 by means of lateral lugs or projections 17 on the bowl 16, the lugs being provided with apertures adapted to receive the pins or projections 15 on the bowl carrier 10. The ends of the arms of the clamp 11 are adapted to bear upon the lateral lugs or projections 17 on the bowl 16 in order to clamp the bowl in position on the bowl carrier 10. For this purpose, each arm of the clamp 11 is provided with an abutment member 18 projecting there-

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from. The abutment member 18 is preferably in the form of a screw-threaded pin axially adjustable in a boss 19 at the end of each arm of the clamp 11. As shown in Fig. 4, the clamp 11 is counterbalanced or spring-loaded by means of springs 24 so that it is normally maintained in an open position.

The ram cylinder 20 of a hydraulic lifting mechanism as disclosed in our Patent Application No. 22494/48 (Serial No. 649,477) is positioned beneath the bowl carrier 10. The ram 21 of the cylinder 20 is adapted to act upon the clamp 11 to clamp the bowl 16 to the carrier 10 before the carrier 10 and the bowl 16 clamped thereto are raised by further upward movement of the ram. For this purpose, the bowl carrier 10 is provided with an aperture 22 for the passage of the ram 21.

In operation, the bowl 16 is mounted in position on the bowl carrier 10, and the lugs 17 are engaged with the pins 15. The hydraulic lifting mechanism is then operated to raise the ram 21 into a position as shown in Figs. 1 and 3 in which the ram 21 acts upon the clamp 11 to rock the latter about the hinge pins 13 and to cause the abutment members 18 to bear down upon the lateral lugs 17 on the bowl 16. In this position of the ram 21, an enlarged portion 23 thereon bears against the underside of the bowl carrier 10 so that, upon subsequent or continued rising movement of the ram 21, both the bowl carrier 10 and the bowl 16 clamped thereto will be raised. The bowl 16 is thus maintained in a positively clamped position on the bowl carrier 10 during both upward and return movement of the bowl carrier 10.

In Fig. 4, the ram 21 is shown in a lower position with respect to the bowl carrier 10 than in Fig. 3, in which the bowl carrier 10 is supported on a portion of the ram 21 projecting from the cylinder 20. The ram may be provided with an enlarged portion normally supporting the bowl carrier 10 at all times and with a reduced portion which, when the ram is operated, extends from the ram cylinder to act upon the clamping member 11 and maintain the latter in a clamped position during upward and return movement of the bowl carrier 10.

What we claim is:—

1. The improvement in or modification of the mixing machine described and claimed in Patent Application No. 22494/48 (Serial No. 649,477), which consists in the provision of a bowl clamp

acted upon by the hydraulic lifting mechanism to clamp the bowl to the bowl carrier before the said lifting mechanism acts upon the bowl carrier to lift the bowl to the mixing position.

2. A mixing machine according to claim 1 in which the bowl clamp comprises a substantially semi-circular or bifurcated clamping member mounted above the bowl carrier and having its arms pivotally attached thereto at a distance from the ends of the arms of said clamping member, the ends of which are adapted to bear upon lateral lugs, projections or flanges on the bowl in order to clamp the bowl in position on the bowl carrier when the clamping member is rocked about its pivotal axis by the engagement of the hydraulic lifting mechanism with the underside of the clamping member at a point midway between the ends thereof.

3. A mixing machine according to claim 2 in which the ends of the arms of the clamping member are provided with axially adjustable abutment members adapted to bear upon the lateral lugs, projections or flanges on the bowl when the latter is clamped to the bowl carrier.

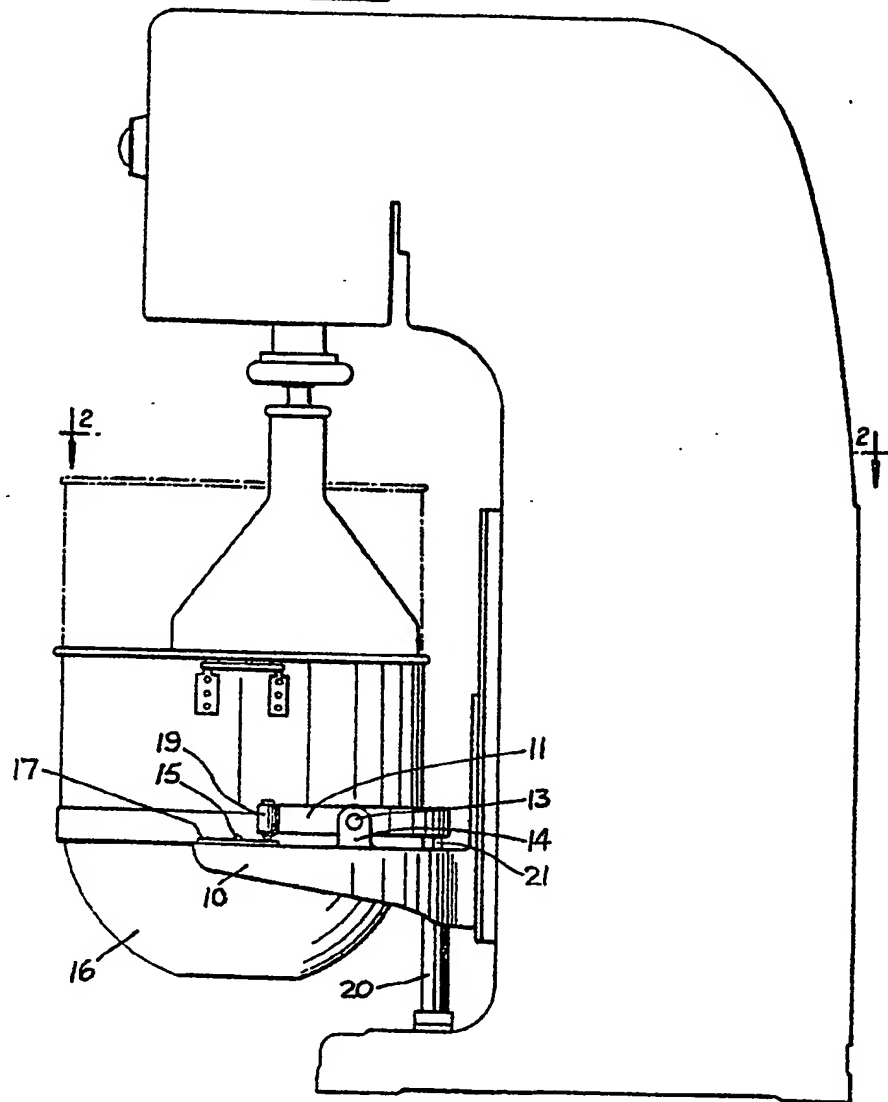
4. A mixing machine according to claim 3 in which the bowl is located on the bowl carrier by means of upstanding pins on the carrier, said pins being received in corresponding apertures provided in said lateral lugs, projections or flanges on the bowl.

5. A mixing machine according to any preceding claim in which the clamp is counterbalanced or spring-loaded to maintain it in a normally open position.

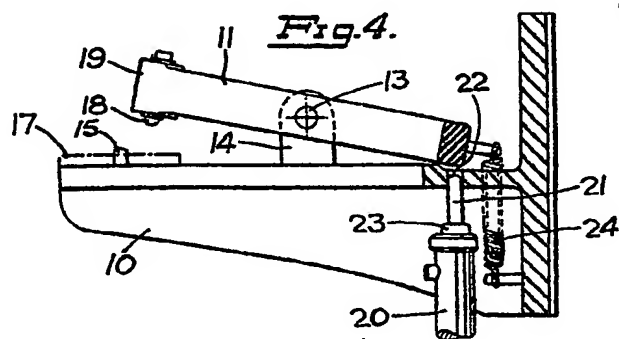
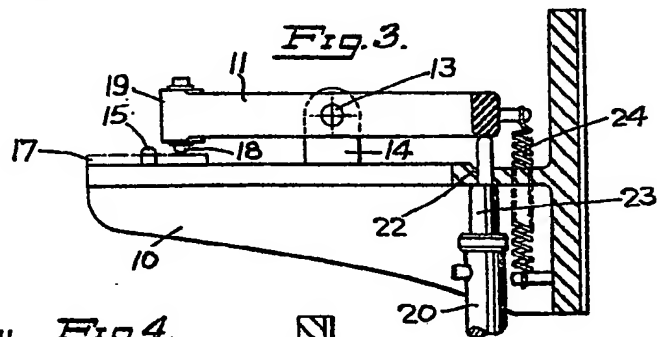
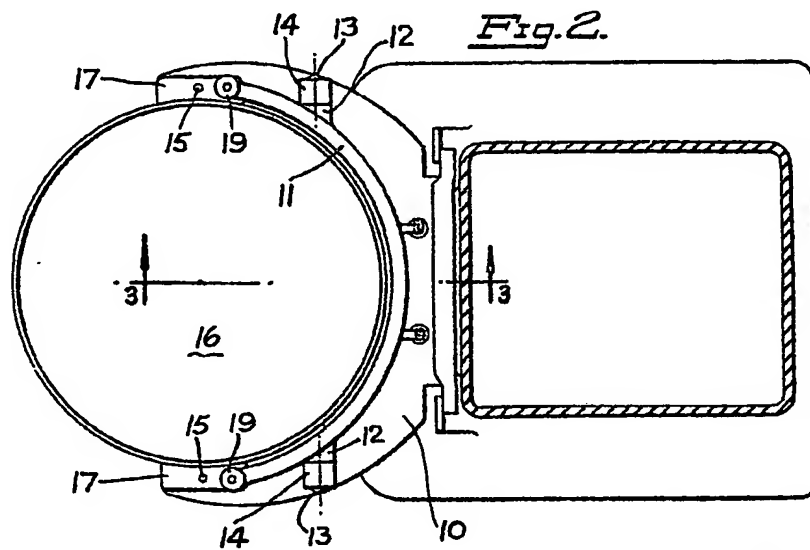
6. A mixing machine according to any of the preceding claims in which initial operation of the lifting mechanism causes a hydraulic ram to act upon the underside of the clamp to move the latter into clamping engagement with the bowl on the bowl carrier, and subsequent or continued operation of the lifting mechanism causes the hydraulic ram to bear upon the bowl carrier to raise the latter while the bowl is maintained in a clamped position on the carrier during the further upward or return movement of the bowl carrier.

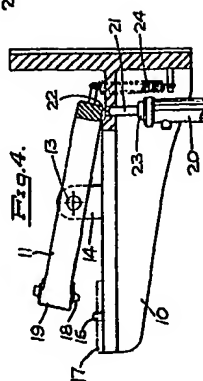
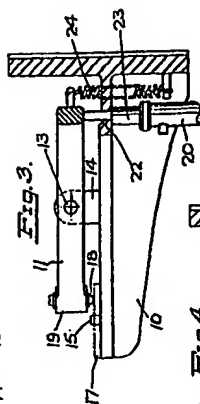
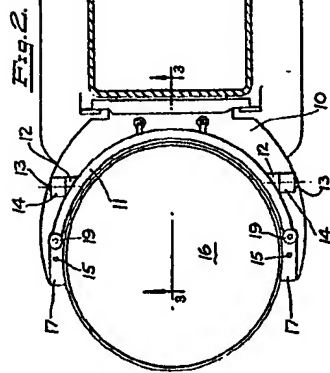
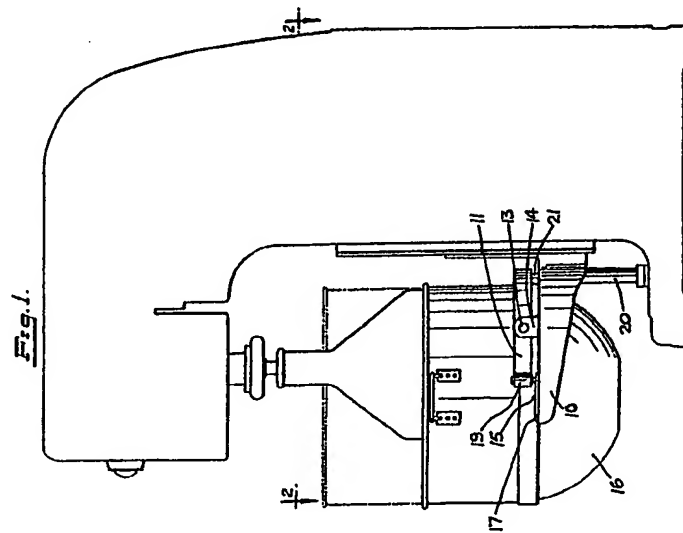
7. A mixing and agitating machine or batch dough mixer as claimed in Patent Application No. 22494/48 (Serial No. 649,477) improved or modified substantially as hereinbefore described with reference to the accompanying drawings.

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Fig. 1.

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